

A SURVEY OF THE PARASITES FOUND IN NATIVES OF SIERRA LEONE

BY

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This investigation was carried out with the object of obtaining an indication of the infection rate among Sierra Leone natives of the common intestinal parasites.

The stools of five hundred natives, all prisoners in the Freetown gaol and all adult males, were examined. The results are, therefore, not quite representative of the native population as a whole, as women and children are not included. Nevertheless, so far as it goes, it is fairly comprehensive, because all the tribes found in Sierra Leone Protectorate are represented and 75 per cent. of the people examined were living in Freetown at the time of arrest; the remaining 25 per cent. were living in various parts of the Protectorate. Gaol infection may be excluded, for the examinations were made within a few days of incarceration in the prison.

Only a single specimen of faeces was examined from each individual, but at least two smears in normal saline under a seven-eighths inch square cover glass were completely examined in every case, and where necessary, specimens in Lugol's solution were made as well. In addition to this examination, a portion of the faeces was mixed in saturated salt solution for detection of helminth eggs that had been missed in the thin smears.

(a) PROTOZOA

Table I gives a list of all the Protozoa encountered, with the number of infections expressed in percentages.

TABLE I

Parasite	Per cent. infected	Parasite	Per cent. infected
<i>Entamoeba histolytica</i>	15	<i>Giardia intestinalis</i>	2.2
„ <i>coli</i>	43.6	<i>Cbilomastix mesnili</i>	1.8
<i>Endolimax nana</i>	9.8	<i>Trichomonas bominis</i>	2.2
<i>Iodamoeba butschlii</i>	13	<i>Enteromonas intestinalis</i>	2.4
		Coprozoic flagellates	14.6

The nomenclature in the above table is taken from Dobell and O'Connor (1921), and under 'Coprozoic flagellates' are grouped all the species so classified by the same authors, because their cysts are not distinguishable from each other in fresh smears.

There is nothing remarkable in the above figures, except perhaps the small number of natives infected with certain flagellates, especially *G. intestinalis*. Vegetative forms of the Amoebae and their cysts have been included under the one head. Five cases of infection of Amoebae with *Sphaerita* spp. were encountered; two of these were in *E. histolytica*, two in *E. coli* and one in *I. butschlii*.

There were, of course, several cases of infection with two or more parasites, but no analysis of these has been made, for it is not considered that such figures are of any practical importance.

(b) HELMINTHS.

In Table II are given a list of the intestinal worms found, the diagnosis being made by the presence of eggs in the faeces. The infection rate is expressed in percentages of the 500 stools examined.

TABLE II

Parasite	Per cent. infected	Parasite	Per cent. infected
<i>Ascaris lumbricoides</i>	36.6	<i>Enterobius vermicularis</i>	1.6
<i>Trichuris trichiura</i>	18.6	Hookworm*	76.6
<i>Strongyloides stercoralis</i>	15.2	<i>Taenia</i> sp.	3.2

* Dr. Adler, of the Sir A. L. Jones Laboratory, examined 4,305 adult Hookworms taken from 47 different cases and found that 91.3 per cent. were *N. americanus* and 8.7 per cent. were *A. duodenale*. Of the total of 376 *A. duodenale*, 302 came from two cases who were not gaol prisoners. Worms examined from prisoners were *N. americanus* 98 per cent. and *A. duodenale* 2 per cent., which is probably the more correct figure for the Colony as a whole.

The percentage of *S. stercoralis* is probably much lower than the actual number, for many faeces, negative by ordinary examination, were found to contain this parasite after culturing which was being done for another purpose. Indeed, it is considered probable that if this method were employed, the infection rate with *S. stercoralis* would be found to be almost, if not quite, as high as that with Hookworm.

The *Taenia* cases are probably all *T. saginata*, for that is the only cestode the writer has found in natives in Freetown; the eggs were slightly oval and none were round, this being given as a diagnostic character between the eggs of *T. saginata* and *T. solium*.

MICROFILARIA.

Thick films of night blood were examined in 288 cases and *Mf. bancrofti* were present in 16.3 per cent., and *Mf. perstans* in 2.4 per cent. Out of the 195 thick films of day blood no infections with *Mf. Loa* were discovered.

(c) A NOTE ON THE USE OF SATURATED SALT SOLUTION FOR THE DETECTION OF HELMINTH EGGS IN FAECES.

Lane (1922) has discussed this method in detail along with others, and he drew attention to its value for the detection of eggs other than those of hookworm, so it is only proposed to deal with the method quite briefly, in confirmation of Lane's remarks.

Technique :—

Small solid watch glasses were used for mixing the faeces ; they contain about 8 c.c. when filled sufficiently to have a distinct convex meniscus. Care was taken to use a little less than 0.5 grams of faeces so as to keep within the limit of effective concentration ; the importance of this precaution has been shown by Lane. It was found quite easy after a little practice to take the right amount of faeces by guesswork. The faeces were first thoroughly emulsified in about 2 c.c. of salt solution by stirring with a glass rod, more salt solution was then added, until there was a distinct convex meniscus above the surface of the watch glass. The emulsion was left for about five minutes to allow the eggs to come to the surface, and a glass slide 3 ins. by 2 ins. was laid on top of it. The slide was lifted off in about half a minute and rapidly turned over to bring the wet surface uppermost without allowing the fluid to run off, and it was examined under the low power of the microscope without a cover slip. The eggs, whatever the species, were always floating on the surface of the film of fluid, therefore even in the case of hookworm eggs, the character they possess of adhering to glass played no part in the success of the method.

The saturated salt solution was always prepared by boiling excess of salt in water and allowing it to cool, and as Lane (1922) has pointed out, this method of its preparation always assured the obtaining of a solution of slightly over 1,200 specific gravity.

Table III gives the number of times each species of egg was found in plain smears and the number of times it was found in salt solution after having been missed in plain smears ; when eggs were found in plain smears, they were always found again by salt concentration.

TABLE III

	<i>Ascaris</i>		<i>Trichuris</i>		<i>Strongyloides</i>		<i>Oxyuris</i>		Hookworm		<i>Taenia</i>	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Plain smear ...	159	86.9	36	38.7	74	97.4	6	75	223	58.2	15	88.2
Salt solution ...	24	13.1	57	61.3	2	2.6	2	25	160	41.8	2	11.8

The different percentages of positive results for different eggs is due to the number present in a given volume of faeces ; those

species such as *Ascaris*, in which a large number of eggs are present give a relatively high number of positives in plain smears and a correspondingly low number after salt concentration, whereas in the case of *Trichuris* which only has few eggs present, the reverse is the case. As Lane has already found, the larvae of *Strongyloides* do not readily come to the surface in salt solution, in fact, many cases which were positive in plain smears were negative in salt concentration.

REFERENCES

- DOBELL, C., and O'CONNOR, F.W. (1921). The Intestinal Protozoa of Man. London.
- LANE, C. (1922). The mass Diagnosis of Ankylostome Infestation (Part 1). *Trans. Roy. Soc. Trop. Med.*, Vol. XVI, p. 274.